YUDKOVSKIY, M. (L'vov); KOVTUN, N. (L'vov)

Seminar-workshop for physics teachers. Fiz. v shkole 20 no.4: 100-102 Jl-Ag '60. (MIRA 13:8)
(Physics--Study and teaching)

8(0), 32(3)

SOV/112-58-3-4063

Translation from: Referativnyy zhurnal. Elektrotekhnika, 1958, Nr 3, p 84 (USSR)

AUTHOR: Kovtun, N. F.

TITLE: 778 Kilometers of the Omsk Railroad Have Been Electrified (Na Omskoy zheleznoy doroge elektrifitsirovano 778 kilometrov)

PERIODICAL: Elektr. i teplovozn. tyaga, 1957, Nr 2, p 32

ABSTRACT: The electrification of Omsk-Nazyvayevskaya section was completed by the end of 1956. Six standard traction substations were built; 306 km of contact lines were erected. RMNV-500/6 mercury rectifiers were installed at substations. The rectifiers are supplied from a 110-kv transmission line via TM-7,500/110 and TMRU-6,200 stepdown transformers. Voltages of 10 and 35 kv from a traction substation will be available for adjacent industries, kolkhozes, sovkhozes, and machine-and-tractor stations. The contact line consists of two copper 100-mm^2 wires, a BM-95 steel-and-copper messenger cable, and an A-185 additional feeder. The possibility of eventual automation

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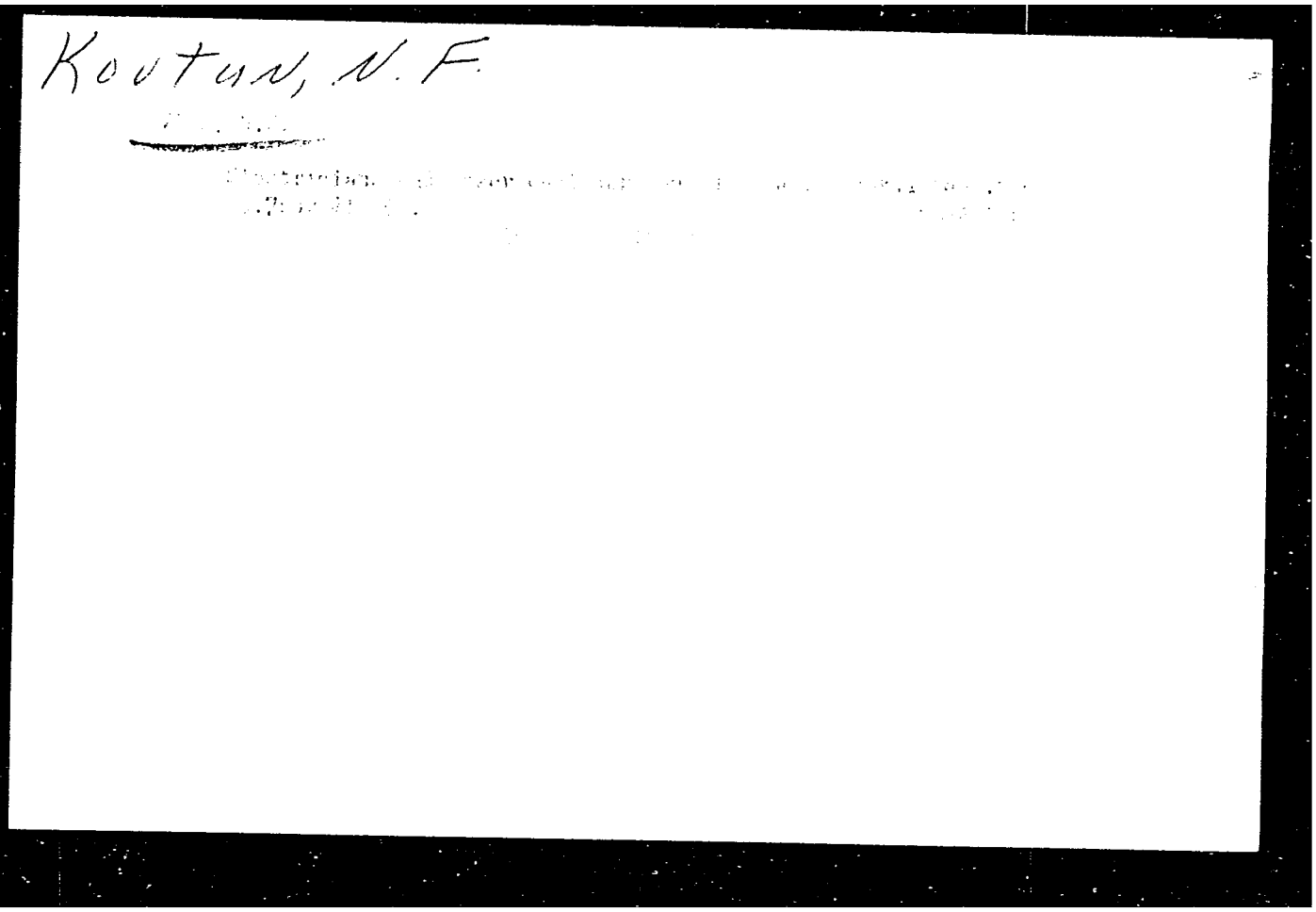
8(0), 32(3) SOV/112-58-3-4063

778 Kilometers of the Omsk Railroad Have Been Electrified

of the substations was provided in their construction. At present, the Moskovka-depot locomotives operate in three directions: to Tatarskaya, Isil'-Kul', and Nazyvayevskaya. By the beginning of 1957, 778 km of the Omsk railroad track had been electrified.

T.A.K.

Card 2/2



Kovtun N.F.

KOVTUN, N.F.; BOBROV, Ye.G.

New rapid-acting VAB-28 switch. Elek. i tepl. tiaga no.12:11-14 D '57.
(MIRA 11:1)

1. Glavnyy inzhener sluzhby elektrifikatsii i energeticheskogo khozyaystva Omskoy dorgi (for Kovtun). 2. Zamestitel' nachal'nika tekhnicheskogo otdela sluzhby Omskoy dorogi (for Bobrov).
(Electric switchgear)

KOVTUN, N.F., inzh.

Ways to improve the power supply for d.c.electric railroads.
Zhel.-dor.transp. 41 no.9:45-50 S '59. (MIRA 13:2)

1. Nachal'nik sluzhby elektrifikatsii i energeticheskogo khozyaystva Omskoy dorogi.
(Electric railroads--Substations)

KOVTUN, N.F., inzh.

How to protect a grounded section during overhead line work.
Elek.i tepl.tiaga 5 no.11:22-23 N '61. (MIRA 14:11)
(Electric railroads—Maintenance and repair)

BOBROV, Yevsey Gdal'yevich; KOVTUN, Nikolay Fedorovich; SOKOLOV, S.D., kand. tekhn. nauk, retsenzent; SIDOROV, N.I., inzh., red.; MEDVEDEVA, M.A., tekhn. red.

[Mercury rectifier unit with series-connected rectifying elements] Rtutnovypriamitel'nyi agregat s posledovatel'nym soedineniem ventilei. Moskva, Vses.izdatel'sko-poligr.ob"edinenie M-va putei soobshcheniia, 1961. 106 p. (MIRA 15:2)
(Electric current rectifiers)

BOBROV, Ye.G., inzh.; GLUKH, Ye.M., inzh.; KOVTUN, N.F., inzh.; FLEYSHMAN, L.S., inzh

Utilization of the power potentials of traction substations. Zhel.dor.transp. 43 no.6:22-27 Je '61. (MIRA 14:7)

1. Glavnyy konstruktor po rtutnym vypryamitelyam zavoda "Uralelektroapparat" (for Glukh). 2. Nachal'nik konstruktorskogo byuro zavoda "Uralelektroapparat" (for Fleyshman).

(Electric railroads--Substations)

KOVTUN, N.K.

Reducing the noise of planing and milling machines during the processing of wood. Der. prom. 13 no.2:12-13 F '64. (MIRA 17:3)

1. Ukrainskiy nauchno-issledovatel'skiy institut mekhanicheskoy obrabotki drevesiny.

KOVTUN, N.K.

Practical use of completed studies on noise abatement in woodworking machinery. Der. prom. 14 no.5:30 My '65.
(MIRA 18:6)

KOVTUN, N. M.

12 июня

(с 10 до 16 часов)

А. В. Гапонов,
Л. А. Островский,
Г. И. Фрейдман

К теории ударных электромагнитных волн в нелинейных средах.

В. Я. Антоньянц

Новый метод измерения ширины кривой поглощения в ферритах.

Я. А. Моносов

К теории нелинейных явлений в ферритах на СВЧ.

Я. А. Моносов,
А. В. Вашковский

Исследование нелинейных явлений в ферритах на СВЧ

12 июня

(с 18 до 22 часов)

А. К. Столяров,
А. Л. Микаэлян

Резонансные ферритовые вентили

70

Н. М. Ковтун

Резонансные явления в волноводах сложной формы поперечного сечения, содержащих поперечно-намагниченную ферритовую пластину

М. М. Кобяков,
Л. В. Мостовой

Исследование нелинейных физических свойств в полосковой линии с ферритом

М. В. Вамберский

Электродинамика волноводного вентиля

"See "Propagation of Electromagnetic Waves in Wave Guides with Complex Cross Sections Containing a Cross-Magnetized Ferrite Plate," by N.M. Kovtun, Khar'kov State Univ. im. A.M. Gor'kiy

report submitted for the Centennial Meeting of the Scientific Technological Society of Radio Engineering and Electrical Communications im. A. S. Popov (VNORIE), Moscow, 8-12 June. 1959

9.1300

S/109/60/005/009/008/026
E140/E455

AUTHOR: Kovtun, N.M.

TITLE: Electromagnetic Propagation in a Waveguide With Complex Cross-Section Containing Transversely Magnetized Ferrite Plates

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol.5, No.9, pp.1426-1430

TEXT: The article considers H-, ⊓- and ⌐-shaped waveguides. Equations are obtained for investigating the propagation constant in dependence on the waveguide and ferrite parameters and the ferrite position. Analysis of these equations will be presented in a subsequent article. Acknowledgments are expressed to A.I.Tereshchenko and V.M.Sedikh for useful discussions. There are 2 figures and 7 references: 6 Soviet and 1 English.

ASSOCIATION: Khar'kovskiy gosudarstvennyy universitet im. A.M.Gor'kogo. Kafedra fiziki SVCh (Khar'kov State University im. A.M.Gor'kiy. Chair of VHF Physics)

SUBMITTED: June 24, 1959

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21579
S/109/60/005/010/002/031
E033/E415

9,1310 (9150 1130)

AUTHORS: Kovtun, N.M. and Tereshchenko, A.I.

TITLE: Investigation of the Characteristics of Resonance Ferrite Isolators (Valves) in H-Waveguides

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol.5, No.10, pp.1593-1597

TEXT: The authors briefly review the properties and applications of П- and H-shaped waveguides. The wide-band properties of the H-waveguide, together with the directional attenuation properties of resonant ferrite isolators, may be used to obtain waveguide "valves". The manner in which the forward and reverse wave attenuations, the forward-to-reverse ratio and the bandwidth depend on the dimensions of the H-waveguide are investigated theoretically and experimentally. The investigation refers to an H-waveguide such as shown in Fig.1, with a ferrite lamina placed parallel to the narrow wall of the waveguide and magnetized along the axis z. The author (H.M.Kovtun, Ref.6) has previously derived a transcendental equation for the relative propagation constant of such an arrangement and, from this equation, an expression is now obtained by successive approximation which

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expresses the forward and reverse attenuation in terms of the waveguide dimensions and the free-space wavelength. The results are presented graphically. Curves are given showing the relation between the forward and reverse wave losses and the position of the ferrite lamina in the waveguide with different values of the ratio of the waveguide dimensions g/b, g being the "bridge" dimension. For comparison, corresponding curves are given for a rectangular waveguide with dimensions a and b. The curves for the H-waveguides and the rectangular waveguides are similar; the ferrite position for minimum forward loss is the same for both and is independent of g/b. The position for maximum reverse loss moves to the centre of the waveguide as the ratio g/b is reduced. Maximum forward-to-reverse ratio occurs when the value of g/b is such that the positions of the ferrite for minimum forward loss and for maximum reverse loss coincide. The dependence of the forward and reverse losses on the position of the ferrite lamina for various values of the ratio a_4/a, a_4 being the width of the bridge. The parameter a_4/a has little effect on the position of the ferrite for maximum reverse loss and, therefore, the width a_4 can always be made such that a_o equals

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the distance from the wall to the bridge step (up to point A in Fig.1). In this case, the lamina has direct contact with the waveguide and better cooling is obtained. Also it is easier to fix the ferrite into the waveguide. The effect of asymmetry is discussed and it is concluded that the position of the ferrite corresponding to maximum reverse loss suffers little change for small asymmetry. The frequency characteristic of the "waveguide valve", i.e. the dependence of the forward and reverse losses on frequency, was investigated experimentally. The waveguide dimensions were a = 23 mm; b = 10 mm; a_4/a = 0.39; g/b = 0.43. The critical frequency was 1.6 times less than for the corresponding rectangular waveguide. The positions for the ferrite lamina for minimum forward and maximum reverse loss did not quite coincide but the difference was less than in the rectangular guide. The frequency characteristics for a single ferrite lamina are presented graphically. The reverse loss is greater than 27 db and the forward loss is of the order of 1.1 to 1.2 db in the 8000 to 10300 Mc/s band. For lower frequencies, the forward loss increases sharply. To improve the bandwidth, a dielectric lamina was included. The forward loss was then

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E033/E415

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practically constant at 0.4 db over the whole band and the forward-to-reverse ratio was not worse than 45. There are 7 figures and 6 references: 4 Soviet and 2 non-Soviet.

ASSOCIATION: Khar'kovskiy gosudarstvennyy universitet im. A.M.Gor'kogo Kafedra fiziki SVCh (Khar'kov State University imeni A. M. Gor'kiy, Physics Department SVCh)

SUBMITTED: December 26, 1959

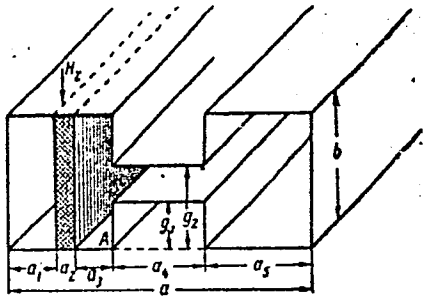

Fig.1.

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S/057/60/030/009/013/021
B019/B054

9,1300 (1006,1144,1331)

AUTHORS: Kovtun, N. M. and Tereshchenko, A. I.

TITLE: Calculation of the Propagation Constants in H-Type Waveguides With a Cross-magnetized Ferrite Plate

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol. 30, No. 9, pp. 1077-1080

TEXT: The authors present some results of an investigation of the propagation constants in an H-type waveguide with a cross-magnetized ferrite plate (a_2 = 3 mm) which is directly fastened onto the wall of the waveguide (Fig. 1). The overall width of the waveguide is a = 23, its overall height b = 10 mm (standard 3-cm waveguide). A formula (1) is given for the propagation constant. Some results obtained by interpolation of (1) are graphically shown in Figs. 2 and 3. The authors studied the dependence of the difference in phase shifts on the antisymmetrical components of the magnetic permeability tensor at different heights of the waveguide bridge, this dependence being equal to that of a rectangular waveguide. The dependence of the maximum difference of phase shift on the bridge

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84447

Calculation of the Propagation Constants in H-Type Waveguides With a Cross-magnetized Ferrite Plate

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width is linear, i.e., the maximum difference of phase shift with given parameters is the smaller, the longer the critical wavelength. This is explained by the fact that the propagation conditions in these waveguides approach those in the free space. Further, the authors conclude that it is necessary to use waveguides with short critical wavelengths to obtain large phase shifts. There are 3 figures and 9 references: 6 Soviet and 3 US.

ASSOCIATION: Khar'kovskiy gosudarstvennyy universitet im. A. M. Gor'kogo (Khar'kov State University imeni A. M. Gor'kiy)

SUBMITTED: February 8, 1960

Card 2/3

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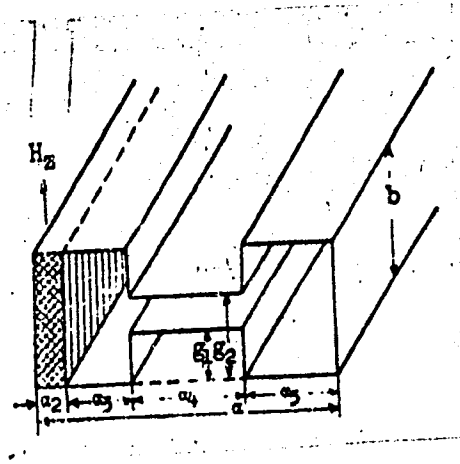

Card 3/3

KOVTUN, N. M.

Cand Phys-Math Sci - (diss) "Study of H-shaped waveguides (looked at end-on) containing transversely magnetized ferrite sheets." Moscow, 1961. 8 pp; (Ministry of Education RSFSR, Moscow State Pedagogical Inst imeni V. I. Lenin); 275 copies; free; (KL, 7-61 sup, 219)

23726

S/057/61/031/006/010/019
B116/B203

9,1300

AUTHORS: Kovtun, N. M. and Tereshchenko, A. I.

TITLE: Propagation of electromagnetic waves in waveguides of cruciform cross section and a transversely magnetized ferrite plate

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 6, 1961, 704-711

TEXT: The authors present the results of a theoretical study of the propagation of electromagnetic waves in waveguides of cruciform cross section and a magnetized ferrite plate. They study such a waveguide (Fig. 1) assuming that the ferrite plate is magnetized along the z-axis, and its permeability can be expressed by

$$\|\mu\| = \begin{vmatrix} \mu & ik & 0 \\ -ik & \mu & 0 \\ 0 & 0 & \mu_z \end{vmatrix}, \qquad (1)$$

μ and k depend on H_z, and are complex if there are losses (Ref. 7: A. L. Mikaelyan. Dokt. diss., M., 1955). To find the propagation constants

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in such a waveguide, the authors use the method of joining of solutions for the simple rectangular ranges into which the whole waveguide cross section can be divided. With the use of Galerkin's method [Abstracter's note: not stated], the authors derive, for the case of "low" waveguides (Ref. 9: Ya. N. Fel'd. ZhETF, 9, 1944), the transcendental equation for the propagation constant χ :

$$\frac{k}{\mu}\chi\left[\frac{h}{b}\left(\operatorname{tg}k_a a_5+\frac{h}{b}k_a a_4\right)(1+\operatorname{tg}k_a a_1\operatorname{tg}k_a a_3)+\left(\operatorname{tg}k_a a_4\operatorname{tg}k_a a_5-\frac{h}{b}\right)\times\right.$$

$$\left.\times(\operatorname{tg}k_a a_1-\operatorname{tg}k_a a_3)\right]\operatorname{tg}k_m a_2-\left\{\frac{\mu_\perp}{\mu_0}k_a\left[\frac{h}{b}\operatorname{tg}k_a a_3\left(\operatorname{tg}k_a a_5+\frac{h}{b}\operatorname{tg}k_a a_4\right)+\right.\right.$$

$$\left.+\left(\operatorname{tg}k_a a_4\operatorname{tg}k_a a_5-\frac{h}{b}\right)\right]+\frac{\mu_0}{\mu_\perp k_a}\left(\frac{k^2}{\mu^2}\chi^2+k_m^2\right)\left[\frac{h}{b}\left(\operatorname{tg}k_a a_5+\frac{h}{b}\operatorname{tg}k_a a_4\right)-\right.$$

$$\left.-\operatorname{tg}k_a a_3\left(\operatorname{tg}k_a a_4\operatorname{tg}k_a a_5-\frac{h}{b}\right)\right]\operatorname{tg}k_a a_1\Big\}\operatorname{tg}k_m a_2+k_m\left[\frac{h}{b}(1-\operatorname{tg}k_a a_1\operatorname{tg}k_a a_3)\times\right.$$

$$\left.\times\left(\operatorname{tg}k_a a_5+\frac{h}{b}\operatorname{tg}k_a a_4\right)-(\operatorname{tg}k_a a_1+\operatorname{tg}k_a a_3)\left(\operatorname{tg}k_a a_4\operatorname{tg}k_a a_5-\frac{h}{b}\right)\right]=0. \quad (12)$$

This equation permits a study of the dependence of the propagation constants on the position of the ferrite plate in the waveguide, on the

dimensions and parameters of the ferrite, on the waveguide dimensions, etc. Now, the authors study the case of weak magnetic fields, i.e., the case most important for the practice where the ferrite plate is attached to the waveguide wall ($a_1 = 0$). They study the dependence of χ on the dimensions of the waveguide cross section and on the magnetic field. Results are shown in figures. Fig. 2 shows the dependence of the nonmutual phase shift η on the quantity k of the antisymmetric component of the tensor of the ferrite permeability for different heights h (Fig. 1). $\eta = \gamma_+ - \gamma_-$, where γ_+ and γ_- are the propagation constants of the direct wave and of the back wave, respectively. The dash-lined curve holds for a rectangular waveguide. Since the critical wavelength is determined by a in a rectangular waveguide and by h/b in a cruciform one, it may be concluded that the difference of the nonmutual phase shifts depends on the critical wavelength. Hence, it follows that waveguides with small λ_{crit}, i.e., waveguides with $\lambda_0/\lambda_{crit} \gtrsim 1$, should be used to obtain large phase shifts. Fig. 3 shows the dependence of η on h/b. It is similar to the dependence of η on a in a rectangular waveguide. Now,

the authors study the case of ferromagnetic resonance. They find the solution of Eq.(12) for this range for very thin platelets by means of successive approximation, and obtain the formula

$$\gamma_{\perp} = \pm \frac{A}{D}\left(\frac{k}{\mu}\right)'' + \frac{B}{D}\left(\frac{\mu_0}{\mu}\right)'' + \frac{C}{D}\left(\frac{\mu_\perp}{\mu_0}\right)'', \qquad (15)$$

where

$$A = \left[\left(\operatorname{tg} k_a a_4 + \frac{b}{h}\operatorname{tg} k_a a_5\right)(1 + \operatorname{tg} k_a a_1 \operatorname{tg} k_a a_3) + \right.$$

$$\left. + \frac{b}{h}\left(1 - \frac{b}{h}\operatorname{tg} k_a a_4 \operatorname{tg} k_a a_5\right)(\operatorname{tg} k_a a_3 - \operatorname{tg} k_a a_1)\right] \frac{1}{1 - \operatorname{tg} k_a a_1 \operatorname{tg} k_a a_3};$$

$$B = -\frac{\gamma_0}{k_a}\frac{\operatorname{tg} k_a a_1}{1 - \operatorname{tg} k_a a_1 \operatorname{tg} k_a a_3}\left[\left(\operatorname{tg} k_a a_4 + \frac{b}{h}\operatorname{tg} k_a a_5\right) + \right.$$

$$\left. + \frac{b}{h}\operatorname{tg} k_a a_3\left(1 - \frac{b}{h}\operatorname{tg} k_a a_4 \operatorname{tg} k_a a_5\right)\right];$$

$$C = \frac{k_a}{\gamma_0}\frac{1}{1 - \operatorname{tg} k_a a_1 \operatorname{tg} k_a a_3}\left[\operatorname{tg} k_a a_3\left(\operatorname{tg} k_a a_4 + \frac{b}{h}\operatorname{tg} k_a a_5\right) - \right.$$

$$\left. - \frac{b}{h}\left(1 - \frac{b}{h}\operatorname{tg} k_a a_4 \operatorname{tg} k_a a_5\right)\right];$$

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$$D=\frac{1}{k_a}\left[-\left(\frac{a_4}{\cos^2 k_a a_4}+\frac{b}{h}\frac{a_5}{\cos^2 k_a a_5}\right)+\frac{b^2}{h^2}\left(\frac{a_4}{\cos^2 k_a a_4}\operatorname{tg} k_a a_3+\right.\right.$$

$$\left.\left.+\frac{a_3}{\cos^2 k_a a_3}\operatorname{tg} k_a a_4\right)\operatorname{tg} k_a a_3-\frac{b}{h}\left(1-\frac{b}{h}\operatorname{tg} k_a a_4 \operatorname{tg} k_a a_5\right)\frac{a_3}{\cos^2 k_a a_3}\right].$$

(15) permits a study of the dependence of damping of the direct and back waves, and of the valve ratio, on the waveguide dimensions, on the position of the ferrite plate, and on the parameters of the latter. All calculations were made for symmetrical cruciform waveguides (the projections being symmetrical with the waveguide axis). On the basis of the results, it is possible to determine the dependence of the characteristics of a phase shifter and valve with cruciform waveguides on the dimensions of the cross section and, therefore, on the critical wavelength of the waveguide. It is shown that the nonmutual phase shifts in cruciform waveguides are much larger than in rectangular ones with comparable cross-section dimensions. The valve ratio of resonance ferrite valves with cruciform waveguides decreases with decreasing λ_{crit}. In spite of this, the valves with cruciform waveguides offer a number of advantages over valves with rectangular waveguides: the possibility of operating on

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Propagation of electromagnetic waves ...

high power levels (since a direct contact between the ferrite and the heat-emitting metal wall of the waveguide can be guaranteed with appropriate dimensions of the projection); increase in peak power by increasing the distance between the walls in the place of maximum electric field strength; the possibility of increasing the dimensions of valves and phase shifters, as well as those of the ferrite plates, which is of importance to wave shortening; the ferrites in cruciform waveguides are particularly interesting when the shape of the cross section is used in the whole channel. There are 7 figures and 9 references: 8 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: P. H. Vartanian, J. L. Melchor, W. P. Ayres, Convention Record IRE, 5, 1956.

ASSOCIATION: Khar'kovskiy gosudarstvennyy universitet im. A. M. Gor'kogo (Khar'kov State University imeni A. M. Gor'kiy)

SUBMITTED: July 25, 1960

Card 6/8

25031

S/057/61/031/007/012/021
B104/B108

9,1300

AUTHORS: Kovtun, N. M. and Tereshchenko, A. I.

TITLE: Characteristics of ferrite phase shifters mounted in H wave guides

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 7, 1961, 834 - 836

TEXT: The authors give results of an investigation regarding the effect of parameters and dimensions of ferrites placed arbitrarily in the cross section of H-plane wave guides, on the difference of the phase shifts. The investigations were made with the aid of a high-speed computer. The equation for the propagation constant was given in a previous paper by N. M. Kovtun (Radiotekhnika i elektronika, v. 9, 1960). All calculations were made for the case of small magnetic fields neglecting losses. With the χ_+ and χ_- values found (the propagation constants for two directions of propagation) the difference of the phase shifts was calculated with $\eta = \chi_+ - \chi_-$. The calculations were made for the wave guide shown in Fig. 1, which has the dimensions a and b,

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corresponds to the cross section of a 1 cm rectangular standard wave guide (23 × 10 mm). The results are graphically shown in Figs. 2 - 8. The diagrams of Figs. 2 - 4 show η_1 as a function of a_1 for various wave guide shapes. Fig. 5 shows the dependence of η_{max} as a function of a_2 for various wave guide shapes. It was shown that the optimum position of the ferrite depends on its thickness and this dependence is shown in Fig. 6 for various wave guides. The optimum thickness $a_{2\,opt}$ of the ferrite is reduced with extension of the critical wavelength λ_{cr}. There are 8 figures and 6 references: 5 Soviet-bloc and 1 non-Soviet-bloc.

ASSOCIATION: Khar'kovskiy gosudarstvennyy universitet im. A. M. Gor'kogo (Khar'kov State University imeni A. M. Gor'kiy)

SUBMITTED: October 10, 1960

TERESHCHENKO, A.I.; KOROBKIN, V.A.; KOVTUN, N.M.

Possibility of widening the tuning range of a rectangular resonator with the aid of ferrate. Zhur. tekh. fiz. 31 no.11: 1388-1391 N '61. (MIRA 14:11)

1. Khar'kovskiy gosudarstvennyy universitet imeni Gor'kogo.
(Ferrates--Magnetic properties)
(Electric resonators)

S/058/63/000/003/086/104
A059/A101

AUTHORS: Kovtun, N. M., Tereshchenko, A. I.

TITLE: Investigation of the propagation constants in a cross-shaped waveguide with a ferrite plate

PERIODICAL: Referativnyy zhurnal, Fizika, no. 3, 1963, 25, abstract 3Zh147 ("Uch. zap. Khar'kovsk. un-t", 1962, v. 121, Tr. Radiofiz. fak., v. 5, 32 - 38)

TEXT: The dependence of the nonmutual phase shift in a ferrite phase shifter on cross section of a cross-shaped waveguide is examined. The waveguide section including the rectangular transversally magnetized ferrite plate is divided into five rectangular regions. Then, the fields are stitched together at the boundaries, and the dependence of the field on one of the coordinates in the sectional plane is taken in the form of a power series and is restricted to a first approximation. As a result, a characteristic equation is obtained which is investigated under the condition of the low strength of the magnetic field and neglecting losses. The dependences of the irreversible phase shift on the

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Investigation of the...

position and the thickness of the ferrite plate, and also on the cross section of the waveguide are plotted. It has been established that maximum shift is obtained with a plate adjacent to the narrow wall of the waveguide. The dependence of the optimum thickness of the plate on the critical frequency of the waveguide has been found.

G. Postnov

[Abstracter's note: Complete translation]

Card 2/2

L 10050-63
EDS
ACCESSION NR: AR3000389 S/0058/63/000/004/H025/H025

49

SOURCE: RZh. Fizika, Abs. 4Zh148

AUTHOR: Kovtun, N. M.; Korobkin, V. A.; Tereshchenko, A. I.

TITLE: On the tuning range of a rectangular waveguide cavity tuned with a ferrite

CITED SOURCE: Uch. zap. Khar'kovsk. un-t, v. 121, 1962, Tr. Radiofiz. fak., no. 5, 44-48

TOPIC TAGS: ferrite-tuned waveguide, rectangular cavity

TRANSLATION: The dependence of the tuning of a rectangular waveguide cavity, by means of a ferrite, on the cavity parameters, is investigated. The tuning range is calculated by the perturbation method for the case when the ferrite plate is located 1) on the side wall and 2) on the end of the cavity. It is shown that for case 1), at a constant resonant wavelength, the tuning range increases with decreasing critical wavelength (with increasing wide wall of the waveguide). For case 2), the dependence is reversed. An experimental check is made on 4

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L 10050-63
ACCESSION NR: AR3000389

cavities measuring 19 by 10, 21 by 10, 23 by 10, and 25 by 10 mm, with a ferrite plate 2.4 mm thick. The results of the experiments agree with the calculations.
Ye. Lebedeva

DATE ACQ: 14May63 ENCL: 00 SUB CODE: SD

cs/ja
Card 2/2

39436
S/109/62/007/008/015/015
D409/D301

9.2571

AUTHORS: Tereshchenko, A.I., Korobkin, V.A. and Kovtun, N.M.

TITLE: Modulation and frequency retuning of a rectangular ferrite cavity-resonator by means of a rotating magnetic field

PERIODICAL: Radiotekhnika i elektronika, v. 7, no. 8, 1962, 1460-1462

TEXT: It is shown that a constant, rotating, magnetic field can be used for modulation and frequency retuning of a ferrite cavity. Thereby the frequency range of variation increases considerably, and the law of change of the frequency can be made sufficiently close to a sinusoidal law. Using the perturbation method and the expression for the magnetic-permeability tensor, one obtains for a thin ferrite plate, placed at the end of the cavity, the relative frequency variation:

$$\frac{f - f_0}{f} = -\left(\frac{k_x}{k_0}\right)^2 \frac{d}{L}\left(\mu_\perp \cos^2\varphi + \mu_\parallel \sin^2\varphi - 1\right), \qquad (3)$$

Card 1/2

Modulation and frequency retuning ...

where $k_x = n\pi/L$; $k_o = \omega/c$; L denotes the length of the cavity, and d the thickness of the ferrite plate; φ denotes the angle of rotation of the magnetic field H. A figure shows the dependence of f on φ, calculated by formula (3), as well as the corresponding experimental curve; there was good agreement between the calculated and experimental values. Another figure shows the following 3 experimental curves: the dependence of the frequency f on the magnetic field H, directed along the z-axis; the same dependence, with the field directed along the y-axis; the curve f versus φ (as in the first figure). In all cases, the same ferrite plate was used; its dimensions were 25 x 10 x 0.8 mm. Formula (3) shows that, for H_o = const., the frequency of the cavity varies with the angle of rotation φ. Thus, a constant, rotating, magnetic field can be used for modulation and retuning of the cavity-frequency. There are 3 figures.

SUBMITTED: March 30, 1962

Card 2/2

ACCESSION NR: AR4023760 S/0274/64/000/001/A064/A064

SOURCE: RZh. Radiotekhnika i elektrosvyaz', Abs. 1A410

AUTHORS: Kovtun, N. M.; Tereshchenko, A. I.

TITLE: Resonant ferrite valve using H-shaped waveguide

CITED SOURCE: Uch. zap. Khar'kovsk, un-t, v. 132, 1962, Tr. Radiofiz. fak., v. 7, 64-70

TOPIC TAGS: resonant ferrite diode, resonant ferrite valve, H shaped waveguide, transmission ratio, dispersion equation, ferrite plate, critical wavelength, forward transmission loss, transmission ratio

TRANSLATION: The losses and transmission ratio are investigated in an H-shaped waveguide with transversely-magnetized ferrite plate placed between the waveguide projections. The dispersion equation

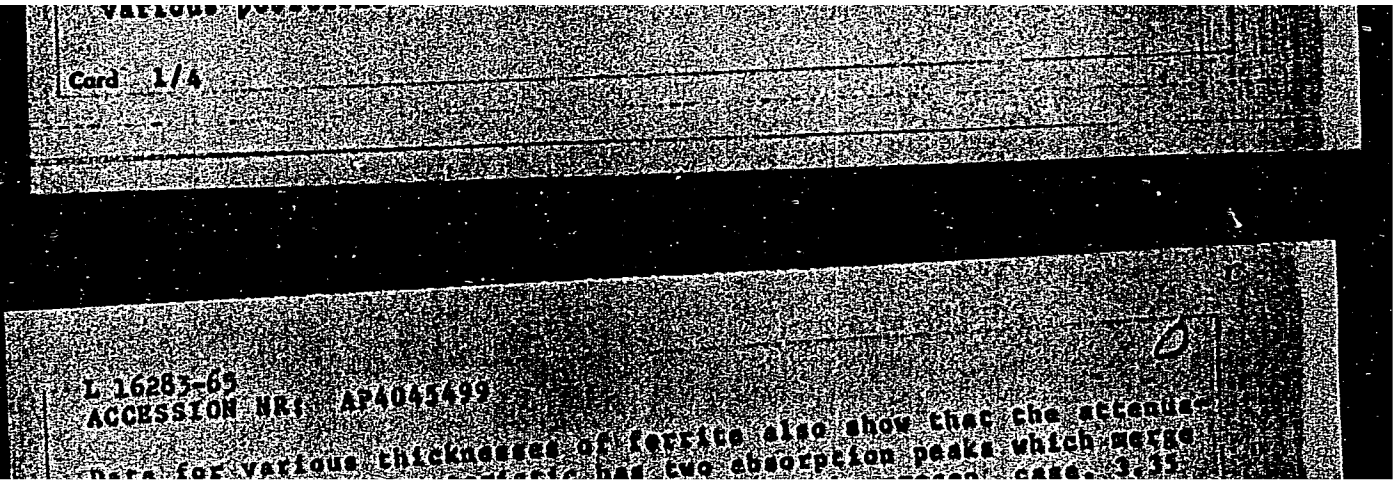
Card 1/2

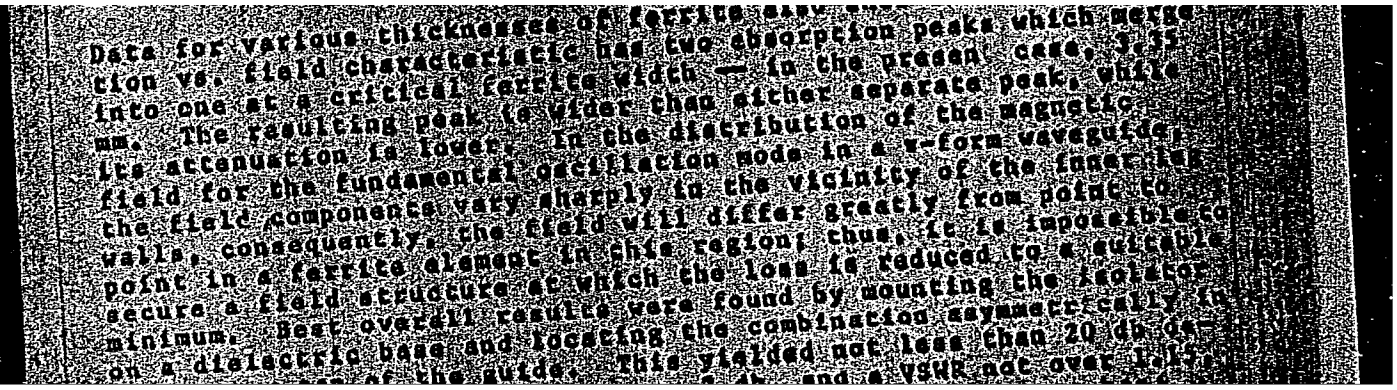
ACCESSION NR: AR4023760

for such a system, assuming very small thickness of the ferrite plate, is written in the form of a Taylor series. The specific calculations are made for a rectifier in a 23 x 10 mm waveguide intended to operate at frequencies on the order of 10 Gc. It is established that the position of the ferrite corresponding to the minimum of the forward losses shifts towards the nearest side wall of the waveguide with increasing critical wavelength of the waveguide λ_{cr}. For a ferrite location that ensures minimum forward losses the transmission ratio has a maximum as a function of λ_{cr}. The bandwidth relative to the transmission ratio increases with increasing λ_{cr} and can exceed by a factor of several times the bandwidth of diodes with rectangular waveguides. Bibliography, 5 titles. V. M.

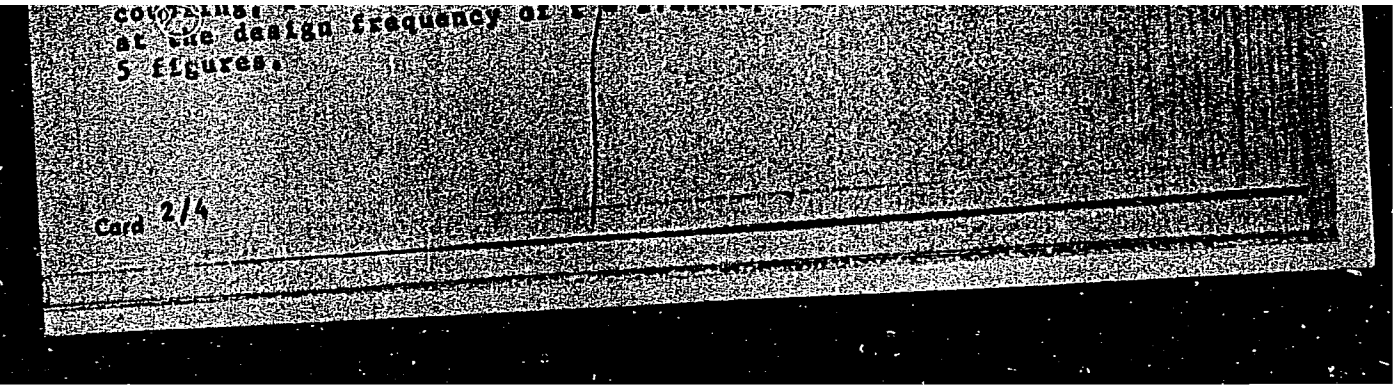
DATE ACQ: 03Mar64 SUB CODE: GE, SD ENCL: 00

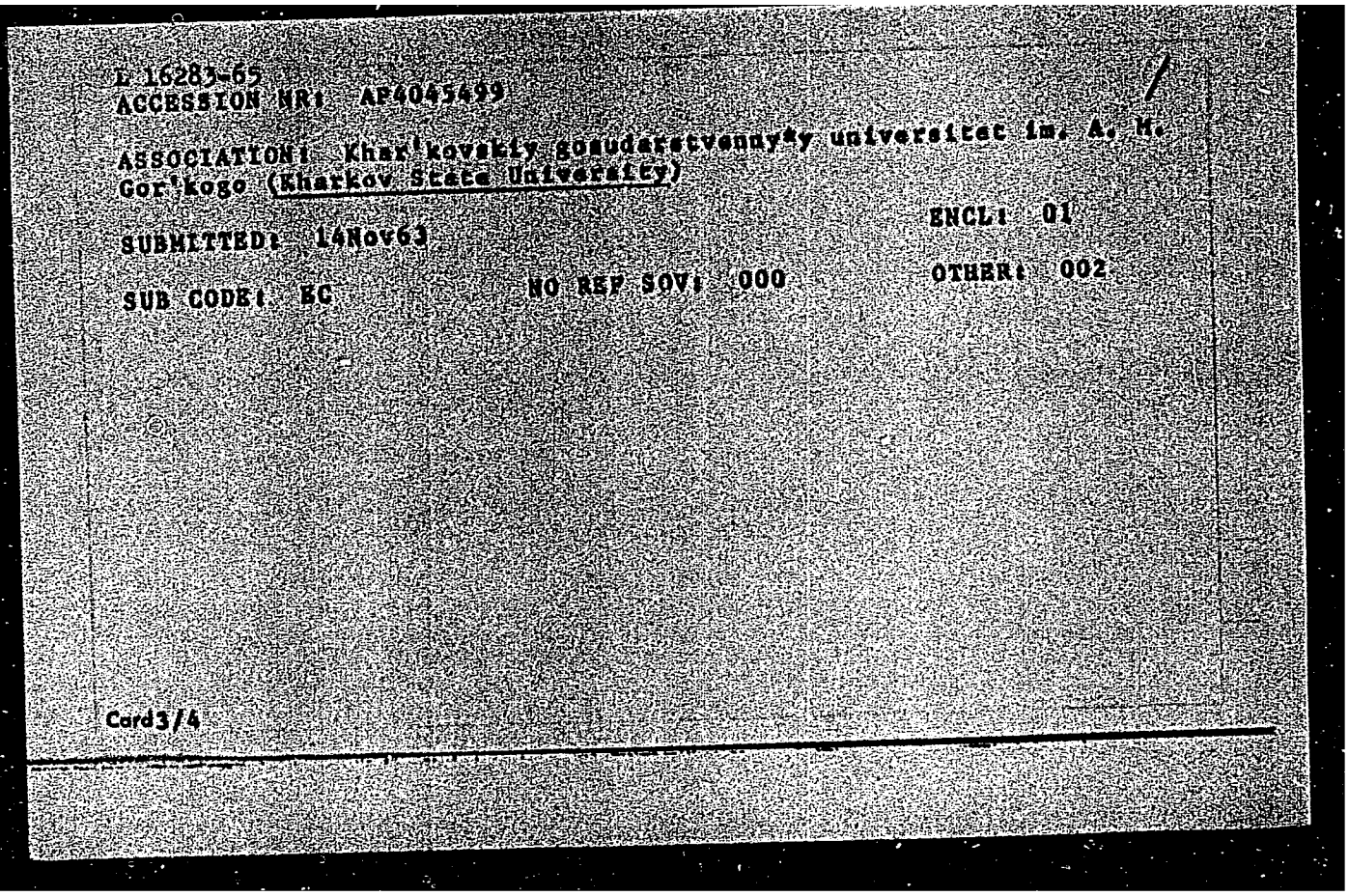
Card 2/2





Data for various thicknesses of ferrite slab [illegible]
tion vs. field characteristic has two absorption peaks which merge
into one at a critical ferrite width — in the present case, 3.55
mm. The resulting peak is wider than either separate peak, while
its attenuation is lower. In the distribution of the magnetic
field for the fundamental oscillation mode in a V-form waveguide
the field components vary sharply in the vicinity of the inner side
walls. Consequently, the field will differ greatly from point to
point in a ferrite element in this region; thus, it is impossible to
secure a field structure at which the loss is reduced to a suitable
minimum. Best overall results were found by mounting the isolator
on a dielectric base and locating the combination symmetrically in
[illegible] of the guide. This yielded not less than 20 db di-
[illegible] and a VSWR not over 1.1 to





L 16283-65
ACCESSION NR: AP4045499

ASSOCIATION: Khar'kovskiy gosudarstvennyy universitet im. A. M. Gor'kogo (Kharkov State University)

SUBMITTED: 14Nov63 ENCL: 01

SUB CODE: EC NO REF SOV: 000 OTHER: 002

Card 3/4

L 16283-65
ACCESSION NR: AP4045499

ENCLOSURE: 01

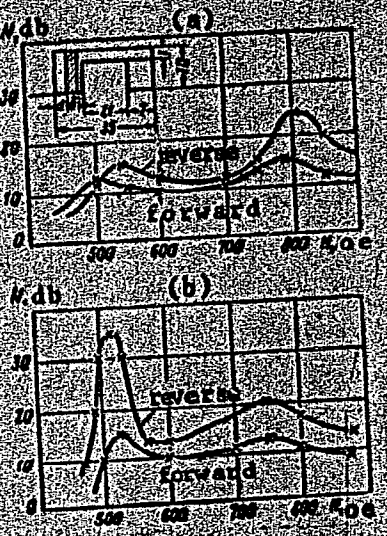


Fig. 1. The relationship between forward and reverse attenuation and magnetic field intensity at two positions of a ferrite isolator in a T-form waveguide.

(a) - d = 0; (b) - d = 3 mm; d = 4 mm.

Card 4/4

SOV/[illegible]-59-2-4/22

14(10)

AUTHOR: Kovtun, N.N., Engineer

TITLE: The Damming of the Araks River Bed at the Bagram-Tapinskiy Hydrotechnical Installation (Perekrytiye rusla r. Araks v stvore Bagram-Tapinskogo gidrouzla)

PERIODICAL: Gidrotechnicheskoye stroitel'stvo, 1959, Nr 2, p 20-22 (USSR)

ABSTRACT: The author describes the damming of the Araks river bed during the construction of the Bagram-Tapinskiy (irrigational) hydraulic installation in Azerbaydzhan. It was necessary to reroute the river flow so that an earth dam could be built. This dam was placed along the temporary 10-span railway bridge. Seven spans were already dammed when a part of the water flow was rerouted through the head-race. A guide-dam was then built from the right shore to

Card 1/2

14(10)

SOV/98-59-2-4/22

The Damming of the Araks River Bed at the Bagram-Tapinskiy Hydrotechnical Installation

increase the flow of the river through the head-race. At the same time, two more spans were dammed. The last span was dammed with 1 cu m concrete blocks pushed into the water by bulldozers. Altogether, 222 such blocks were used, then stone and fascines were thrown on them and the whole was covered with gravel from the river valley. The use of large concrete blocks instead of stony fillers cut down building expenses by 18%. There is 1 layout and 1 table.

Card 2/2

KOVTUN, N.P., inzh.

New regulator for internal combustion engines. Energomashinostroenie 6 no.8:41-42 Ag '60. (MIRA 14:9)
(Governors (Machinery)) (Gas and oil engines)

KOVTUN, N.E.

USSR /Microbiology. Antibiosis and Symbiosis. Antibiotics. E-2
Antibiotics.

Abs Jour: Referat. Zh.-Biol., No. 9, 1957, 35582

Author : Nikitin, V.N.; Butskaia, V.D.; Vorobeva, T.M.; Ermakov, P.P.; Kovtun, N.E.

Title : The Influence of Acidophil Milk (Acidophilin) and Streptomycin on the Growth of Laboratory Animals

Orig Pub: Uch. zap. Kharkovskogo un-ta, 1956, 68, 275-279

Abstract: In 2 series of experiments with mature white rats (55 animals) and 4 series of experiments with white rats at the age of 1 month (45 animals), an increase in the weight of the body was noted when there was added to a rich ration 10 milliliters of acidophilin and 20 units of streptomycin

Card 1/2

Chair of Physiology of Farm Animals, Sci Res Inst. Biology, Biology Faculty, Kharkov State Univ

USSR /Microbiology. Antibiosis and Symbiosis. Antibiotics. F-2

Abs Jour: Referat. Zh.-Biol., No. 9, 1957, 35582

for every gram of body weight. The greatest effect was obtained in the younger rats with the addition of streptomycin.

Card 2/2

KOVTUN, P.G., inshener.

Device for clipping parts after extrusion. Vest.mash. 33 no.11:97-100 N '53. (MLRA 6:12)

(Metal--Extrusion)

KOVTUN, P.G.

USSR/Miscellaneous

Card 1/1 : Pub. 103 - 7/29

Authors : Kovtun, P. G.

Title : The geometry of working die-elements for deep drawing

Periodical : Stan. i instr. 9, 21-23, Sep 1954

Abstract : The importance of proper geometry of the working die-elements for deep drawing of metal is explained. A properly selected geometry for the working elements of drawing dies reduces the degree of deformation of the processed metal and facilitates the drawing conditions. The geometrical parameters of working die-elements from deep drawing of details from thin sheeted-steel are shown. Table, drawings.

Institution : ...

Submitted : ...

USSR/Engineering - Assembly Tools

Card : 1/1

Authors : Kovtun, P. G., Engineer

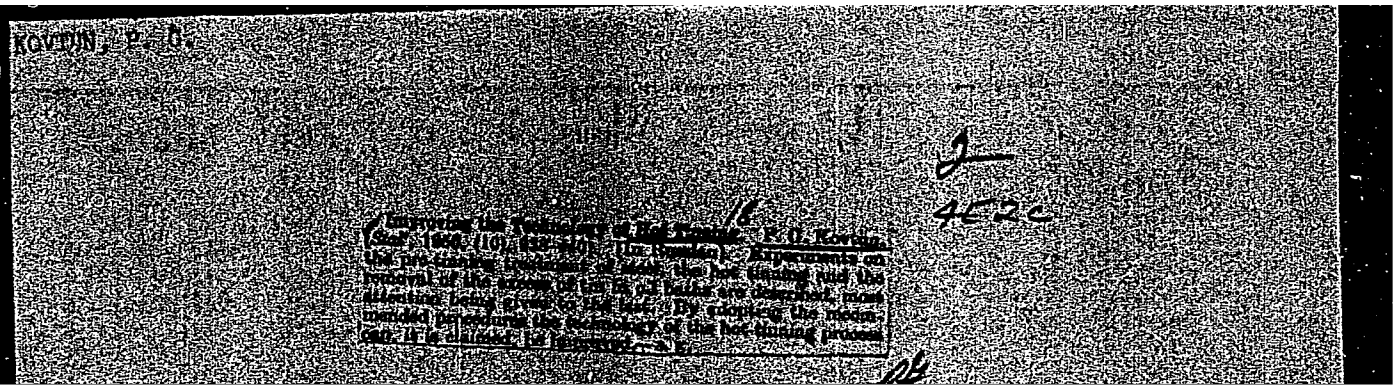
Title : Device for fastening together the parts of containers

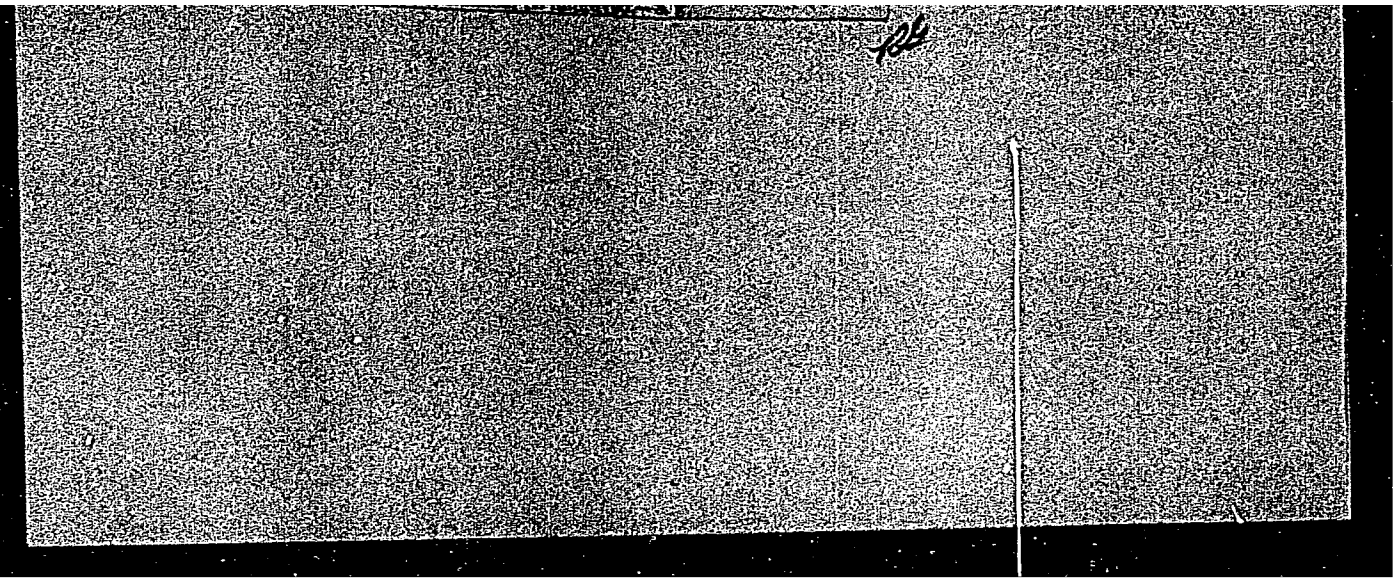
Periodical : Vest. Mash. 34/5, 88 - 89, May 1954

Abstract : A device is described for making containers out of sheet metal.

Institution : ....

Submitted : ....





APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R000825710

KOVTUN, P. G.

Anisotropy of sheet steel and causes of its occurrence. Avt.i trakt.prom. no.8:25-29 Ag '57. (MIRA 10:12)

1. Lysven'skiy metallurgicheskiy zavod.
(Anisotropy) (Steel--Metallography)

Kovtun, P.G.

KOVTUN, P.G., inzh.

Effect of properties of soft sheet steel on the drawing die life.
Vest. mash. 37 no.8:46-47 Ag '57. (MLRA 10:9)
(Dies (Metalworking)) (Steel)

SOV/133-58-7-23/27

AUTHOR: Kovtun, P.G., Engineer

TITLE: Advantages of Using Contact Sulphuric Acid for Pickling Mild Steel (Preimushchestva kontaktnoy sernoy kisloty pri travlenii myagkoy stali)

PERIODICAL: Stal', 1958, Nr 7, p 651 (USSR)

ABSTRACT: Advantages of using contact sulphuric acid instead of tower acid for pickling sheets and other articles are discussed on the basis of experience gained on the Lys'va plant. The formation of a dark film on sheets pickled in tower acid, which is not completely removed by flux (before hot/zinc coating or tinning) was found to be due to arsenic in the acid. A comparison of the yields of 1st quality articles pickled in tower and contact acids is given.

ASSOCIATION: Lysvenskiy metallurgicheskiy zavod (Lys'va Metallurgical Plant)

Card 1/1 1. Steel--Pickling 2. Sulfuric acid--Applications

KOVTUN, P.G., inzh.

Technological improvements in making machine parts of sheet steel. Vest. mash. 38 no.10:52-54 O '58. (MIRA 11:11)
(Sheet steel) (Forging)

S/182/60/000/009/003/012
A161/A029

AUTHOR: Kovtun, P.G.

TITLE: Lubricant Choice for Extrusion of Parts From Thin Sheets

PERIODICAL: Kuznechno-shtampovochnoye proizvodstvo, 1960, No. 9, pp. 10 - 12

TEXT: Various lubricants were tested in extrusion of two cup-shaped thin sheet parts of 10кпГ (10kpG) steel rolled with shot-blasted rolls, with rough and unlubricated surface and carbon content (in sheets) of 0.06 - 0.08%. The reason of tests was lack of information on the effect of various lubricants recommended for deep extrusion (Refs. 1 and 2) on the wear of dies and the quality of work. Details of test techniques are given. A large number of parts was stamped in the tests. Industrial oil, vaseline, industrial oil with 10% graphite, "sulfofrezol" and cotton oil proved unsuitable, many stampings were wrinkled torn or cracked. Lubricants with a high content of soap or soap-oil emulsion (12% of emulsion, 6 and 20% soap) were harmful for dies and work. Better results were obtained with a 6 - 8% emulsion; 6% soap gave satisfactory results in the first extrusion stroke and less good results in the following stroke; at a temperature below 25°C soap separated in flakes and the lubricant became unsuitable.

Card 1/3

S/182/60/000/009/003/012

Lubricant Choice for Extrusion of Parts From Thin Sheets A161/A029

In extrusion of sheets with bright smooth surface and less than 0.05% C content the die surface was spoiled when a 6 - 8% emulsion was used. Good results were obtained with the following lubricants:

No. of lubricants in tests	Composition in %
11	6-% oil-soap emulsion.....90
	graphite..... 3
	bran..... 7
12	same emulsion.....93
	plastic refractory clay or bentonite..... 7
13	same emulsion.....87
	graphite..... 3
	bran..... 5
	refractory clay..... 5

Bran is a good filler, sticks to the surface and retains the lubricant. Clay is to be mixed in the ratio 1 1 clay/1 1 water in a mixer, and added into the emulsion by small portions with rapid stirring. Suspensions of more than 4% refractory clay (or bentonite) keep solid particles in suspension, and graphite and talc added into the suspension do not settle on the bottom. Lubricant No. 13

Card 2/3

proved best. The clay suspensions recommended for extrusion of non-ferrous metals (Ref. 3) proved good for steel. Graphite is a good filler but sticks to the metal surface, addition of refractory clay facilitates its removal. Besides, graphite forms hard and resistant scale in inter-operational annealing of parts. This was the major obstacle in using graphite in lubricants for parts to be annealed. This difficulty was eliminated by dipping the parts (before placing into the furnace) into a solution of 5 - 6% ammonium chloride and 6 - 8% refractory clay in water. Scale forming after such dipping is loose and easily removable. The clay holds firmly graphite and other solid matter, absorbs greasy matter and covers the metal with a thin layer, which makes higher recrystallization annealing possible (730 - 750°C). Thus emulsions with graphite could be used for very deep extrusion. It is recommended for very deep extrusion of thin sheet steel to use 6% oil-soap emulsion in the first operation, and the same emulsion with the fillers mentioned in the second and the following. The use of such lubricants raised considerably the die life and eliminated spoil of work at Lys'venskiy metallurgicheskiy zavod (Lys'va Metallurgical Works). There are: 1 figure, 3 tables and 3 Soviet references.

22066
S/182/61/000/006/003/007
D038/D112

1.1200 also 1454

AUTHORS: Kovtun, P.G., Rozhkov, O.A.

TITLE: Certain factors determining the deep drawing capacity of sheet metal (Under discussion)

PERIODICAL: Kuznechno-shtampovochnoye proizvodstvo, no. 6, 1961, 7-13

TEXT: The article gives the results of experiments carried out at the Lys'venskiy metallurgicheskiy zavod (Lys'va Metallurgical Plant) into the entitled factors under the supervision of Doctor of Technical Sciences L.V. Prozorov, TsNIITMASh. 08кп (08kp) and 10кп (10kp) cold-rolled steel, and imported DIN 1623 steel served as the experimental material. Double-action presses and wear-resistant gray iron cupola dies were used. The deleterious effect of mineral lubricants was established: it caused wrinkling and sticking to the dies. Metallurgical plants were advised to discontinue the oiling of sheet metal and the use of a 25% aqueous solution of sodium nitrite for long-term storage was advocated. A thin oxide film forming in air after annealing is not deleterious but beneficial; however, a thick hard film, varying from light-yellow to gray in color, renders the steel completely unsuitable for drawing. Skin-rolling of sheet and strip with 1-1.2% reduction

Certain factors determining ...

on rough rolls is beneficial. Contrary to the current opinion that deep-drawing steel must have the lowest possible carbon content, it was observed that steel with a bright surface with less than 0.06% C has poor drawing properties but 0.09-0.13% C content improves the drawing capacity, especially when a thin oxide film is present and the sheet surface is not smooth. It has been established at the "Zaporozhstal'" zavod (Plant) that a special ОВГВ(OVGV) deep-drawing steel must contain not more than 0.07% C, and ВГВ (VGV) steel not more than 0.08% C (OVGV and VGV are the internal designations of "Zaporozhstal'"). The anisotropy of its properties is an inherent defect of sheet steel, as it causes tearing in drawing in one direction and folds in the other. It was concluded in experiments that slight anisotropy is permissible but medium anisotropy in sheets with a smooth and bright surface, and more marked anisotropy in sheets with a rough surface, renders the metal wholly unsuitable for deep multi-stage drawing. Insufficient heat treatment, i.e. annealing, was one of the causes of anisotropy in a sheet from rimmed mild steel not deoxidized with aluminum. It was stated by P.G. Kovtun (Ref. 15: Prichiny vyzyvayushchiye obrazovaniye vodorodnoy khrupkosti listovoy stali pri travlenii [Causes of Hydrogen Embrittlement in Sheet Steel Pickling], "Metallovedeniye i termicheskaya obrabotka", no. 9, 1959)

Certain factors determining ...

that pickling of cold-rolled mild steel with anisotropic properties causes a drop in plasticity as a result of hydrogen absorption in dislocations of grain boundaries. Steel imported from the FGR and France and tested at the Lys'va Metallurgical Plant was oiled with mineral oil and had no oxide film on it. The steel was very difficult to draw. It first had to be degreased and heated up to 260°C for four minutes to obtain a thin oxide film. There are 2 figures, 7 tables, and 15 Soviet references.

Card 3/3

S/182/62/000/005/004/C07
D036/D113

AUTHOR: Kovtun, P.G.

TITLE: Selection of the die materials for deep drawing thin sheet parts

PERIODICAL: Kuznechno-shtampovochnoye proizvodstvo, no. 5, 1962, 14-20

TEXT: Numerous investigations and attempts to develop dies for drawing 500 mm deep and 340 mm diam parts were conducted in 1953-1958 at the Lys'venskiy zavod (Lys'va Plant). The composition of the two grades of iron finally developed is as follows: (1) 2.8 - 3.3% C; 1.3 - 1.6% Si; 0.7 - 1.0% Mn; 0.4 - 0.6% Cr; 0.3 - 0.7% Ni; 0.15 - 0.25% P; up to 0.08% S; (2) 2.8 - 3.3% C; 1.4 - 1.8% Si; 0.7 - 1.0% Mn; 0.7 - 1.0% Cr; 1.2 - 1.8% Ni; 0.15 - 0.25% P and up to 0.08% S; a 3-4% addition of open hearth ferrosilicon to the charge improves the iron quality. The iron must be discharged from the cupola at not below 1300°C, and poured in well dried molds at 1250-1270°C. The best dies were produced from the second grade low-alloy iron. Dies provided with interchangeable low-alloy iron rings were 2-2.5 times more durable than the others. To raise durability and improve the

Card 1/2

Selection of the die materials ...

drawing quality, the effective die area should be machined by mineral-ceramic cutting tools. There are 9 figures and 4 tables.

Card 2/2

AUTHORS: Zaostrovskiy, F. P., Kovtun, P. K. SOV/64-58-5-8/21

TITLE: The Condensation of Ammonia From a Nitrogen-Hydrogen Mixture (Kondensatsiya ammiaka iz azoto-vodorodnoy smesi)

PERIODICAL: Khimicheskaya promyshlennost', 1958, Nr 5, pp. 292 - 295 (USSR)

ABSTRACT: In the condensation of ammonia by cooling two processes, the transfer of heat and the mass, take place. The difference in the temperatures of the gas mixture and the cooling surface on the one hand, and the difference in the partial vapor pressure of the condensed component in the interior of the mixture and the pressure of the vapor phase stress at the condensation film at the wall on the other hand play the decisive roles here. The rates of these processes may be at different ratios to one another, so that, for instance, a vapor condensation may take place only at the cooling surface, or it may take place in the interior and lead to the formation of a fog. In order to avoid the latter the cooling of the vapor-gas mixture must apparently take place in such a way that the vapor oversaturation does not exceed the socalled critical oversaturation at which the condensation in the gas volume takes place. In order to determine the conditions

Card 1/3

causing the formation of fog the concentration of the condensing component and the temperature of the gases along the heat exchange surface must be determined. There exist some methods for calculating the cooling of partly condensed gas mixtures. These do not, however, correspond to the conditions mentioned. There are those found by Merkel (Ref 2), Berman (Ref 4), or Colborn and Hougen (Kol'born i Khougen) (Ref 3) which are too complicated. Others are incomplete like that of Jonston (Dzhonston) (Ref 5). In order to investigate the problem mentioned in the title the authors employed the "step-by-step" method of calculating the mobile forces according to K.N.Shabalin et al. In the derivation of the calculation equations the authors mention for the coefficient of the convective heat transfer the formula by Nussel't (Ref 6) and in the case of the coefficient of mass transfer the analogous formula by Shervud (Ref 6). By means of some examples the calculation of this condensation is carried out according to the initial data. The relation of saturation concentrations to the temperature is determined according to the data supplied by Larson and Blek (Ref 7).

The Condensation of Ammonia From a Nitrogen-Hydrogen Mixture SOV/64-58-5-8/21

There are 3 figures and 8 references, 4 of which are Soviet.

1. Ammonia--Condensation 2. Hydrogen-nitrogen mixtures--Chemical effects 3. Hydrogen-nitrogen mixtures--Properties 4. Condensation reactions

Card 3/3

KOVTUN, P.M.

[High millet yields] Vysokyi urozhai prosa. [Kharkiv] Kharkivs'ke obl. vyd-vo, 1955. 23 p. (MLRA 10:3)
(Millet)

KOVTUN, V.P.; KOVTUN, P.P.

Refining of tin in the Tiraspol' "Metallolitografiia" plant. Kons. i ov.prom. 18 no.4:24-25 Ap '63. (MIRA 16:3)

1. Zavod "Metallolitografiya".
(Tiraspol'--Tin--Metallurgy)

KOVTUN, V.P.; KOVTUN, P.P.

New materials for solid lacquer coating of tinned sheet steel.
Kons. i ov. prom. 18 no.11:30-32 N '63. (MIRA 16:12)

1. Tiraspol'skiy zavod "Metallolitografiya."

05204
SOV/142-2-3-12/27

6(6)
AUTHORS: Budov, A.F., Butrim, Yu.I., Kovtun, P.S., Ryazantsev, V.Yu., Yanovskiy, V.[illegible]

TITLE: Experimental Industrial Television Devices

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiotekhnika, 1959, Vol 2, Nr 3, pp 361-363 (USSR)

ABSTRACT: The authors describe briefly the experimental industrial television equipment "Ekran-1", "Ekran-2" and "Ekran-3" which were developed at the Kafedra radiotekhnicheskikh ustroystv Khar'kovskogo politekhnicheskogo instituta imeni V.I. Lenina (Chair of Radio Engineering Equipment of the Khar'kov Polytechnic Institute imeni V.I. Lenin). The device "Ekran-1" was developed in 1956 for the visual control of the work of cutting tools on heavy boring and turning mills with two tool rests. The cameras have the dimensions 170x159x355 mm and a weight of 7 kg. They are mounted directly at the tool rests. The camera commutator unit, the control panel with the TV screen are mounted at the master control panel of the machine tool. During 1957 and 1958 the experimental industrial TV devices "Ekran-2" and "Ekran-3" were developed. These devices are

Card 1/3

Experimental Industrial Television Devices

more universal and produce high-quality images at a distance of 100-150 m. Additional conventional TV sets may be used at distances of up to 1 km from the control unit. The "Ekran-2" may be used for televizing surgical operations. Fig.1 shows the TV camera used for the "Ekran-2" and "Ekran-3". It has the dimensions 110 x 120 x 300 mm and a weight of 3.5 kg. A vidicon pick-up tube is used. A 500 watt light source provides the necessary illumination of 500-1000 lux. With such an illumination the inertia of the vidicon tube is very low and even high-speed production processes may be observed clearly. All TV devices have interlaced image scanning of 600-626 lines. The receiver units of "Ekran-2" and "Ekran-3" are shown by photographs in figs.2 and 3. The interlacing parameters correspond to the USSR TV standard. The synchrogenerator of the industrial TV devices produces a simplified TV signal required for the synchronization of the additional TV sets connected to these devices. The synchrogenerator is composed of ten 6N1P tubes (including cathode followers). The number of bulky parts in the camera units was reduced to a minimum. The focussing of the pick-up tube is achieved by an electric motor operated from the control

Experimental Industrial Television Devices

panel. The conventional TV sets which may be connected to the "Ekran-2" and "Ekran-3" are fed from a transmitter, consisting of a master oscillator-multiplier (6Zh3P) and an output stage (6Zh2P). The "Ekran-2" device contains provisions for transmitting audio frequencies to the conventional TV sets connected to it. All TV devices receive power from the AC mains. In the "Ekran-1" and "Ekran-2" the feed units contain heater transformers and kenotron rectifiers with electronic stabilization which feed all anode circuits. In the "Ekran-3" germanium and selenium rectifiers are used. Electronic stabilization is used only for feeding the synchronization unit and the camera amplifier. A ferro-resonance voltage stabilizer feeds the entire device. All "Ekran" devices contain only four or five control knobs. The publication of this article was recommended by the Kafedra radiotekhnicheskikh ustroystv Khar'kovskogo instituta imeni V.I. Lenina (Chair of Radio Engineering of the Khar'kov Polytechnic Institute imeni V.I. Lenin). There are 4 photographs.

Card 3/3

SUBMITTED: July 24, 1958

Experimental Industrial Television Devices

panel. The conventional TV sets which may be connected to the "Ekran-2" and "Ekran-3" are fed from a transmitter, consisting of a master oscillator-multiplier (6Zh3P) and an output stage (6Zh2P). The "Ekran-2" device contains provisions for transmitting audio frequencies to the conventional TV sets connected to it. All TV devices receive power from the AC mains. In the "Ekran-1" and "Ekran-2" the feed units contain heater transformers and kenotron rectifiers with electronic stabilization which feed all anode circuits. In the "Ekran-3" germanium and selenium rectifiers are used. Electronic stabilization is used only for feeding the synchronization unit and the camera amplifier. A ferro-resonance voltage stabilizer feeds the entire device. All "Ekran" devices contain only four or five control knobs. The publication of this article was recommended by the Kafedra radiotekhnicheskikh ustroystv Khar'kovskogo instituta imeni V.I. Lenina (Chair of Radio Engineering of the Khar'kov Polytechnic Institute imeni V.I. Lenin). There are 4 photographs.

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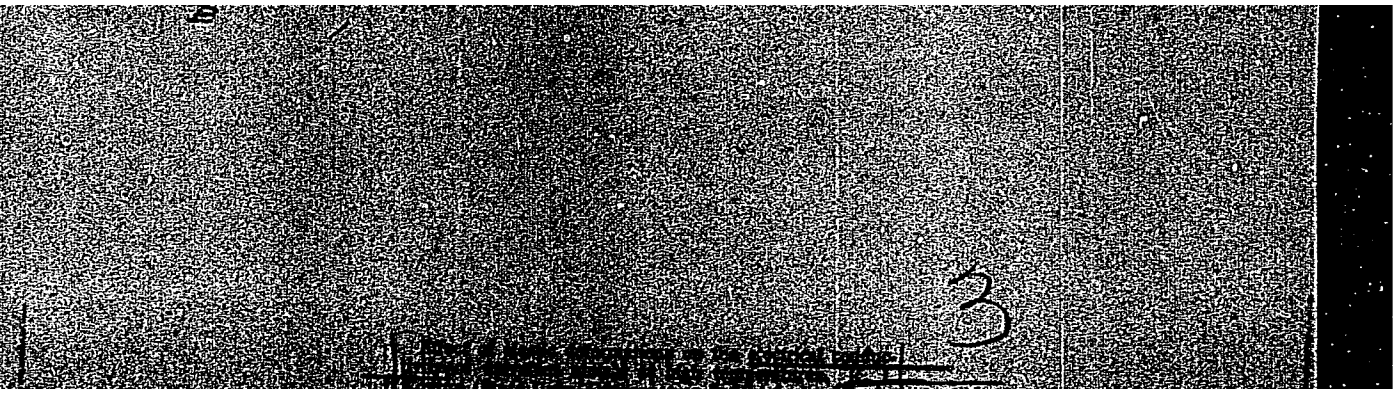
SUBMITTED: July 24, 1958

KOVTUN, P.T.

Selecting efficient cogging conditions in the cold rolling of iron. Metallurg 6 no.3:27-29 Mr '61. (MIRA 14:5)

1. Lys'venskiy metallurgicheskiy zavod.
(Rolling (Metalwork))



DUSHIN, L.A. [Dushyn, L.O.]; KONONENKO, V.I.; KOVTUN, R.I.; PRYVEZENTSEV, V.I. [Pryvezentsev, V.I.]; SKIBENKO, A.I. [Skybenko, A.I.]

Use of an interferometer and the microwave cut-off method in studying a plasma. Ukr. fiz. zhur. 10 no.9:977-984 S '65. (MIRA 18:9)

1. Fiziko-tekhnicheskiy institut AN UkrSSR, Khar'kov.

L 39553-66 EWT(1)/EWP(n)-2/ETC(f)/EWG(m) IJP(c) AT/GS/GD

ACC NR: AT6008859 SOURCE CODE: UR/0000/65/000/000/0189/0198

AUTHOR: Dushin, L. A.; Kononenko, V. I.; Koytun, R. I.; Privezentsev, V. I.; Skibenko, A. I.

ORG: none

TITLE: Studying a plasma by probing with microwaves

SOURCE: AN UkrSSR. Magnitnyye lovushki (Magnetic traps). Kiev, Naukova dumka, 1965, 189-198

TOPIC TAGS: microwave, plasma structure, plasma density, distribution function

ABSTRACT: The authors determine the spatial density distribution function for a plasma by comparing the average density measured by a microwave interferometer with the maximum density determined from the cutoff time of the microwave signals. These data were used for finding the recombination and diffusion coefficient and for estimating the electron temperature in the discharge. The experimental procedure is described in detail and the derivation of the analytical formulas used in the work is discussed. It is shown that curves for the average and maximum plasma densities or their logarithms as functions of time will coincide as long as there is no noticeable diffusion to destroy the initial distribution. The results confirm the data in the literature obtained by spectroscopic analysis of a Phillips discharge. Orig. art. has: 4 figures, 17 formulas.

SUB CODE: 20/ SUBM DATE: 20Oct65/ ORIG REF: 005/ OTH REF: 002

Card 1/1

L 24045-66 EWT(1)/T IJP(c) GS/AT/GM

ACC NR: AT6008843 SOURCE CODE: UR/0000/65/000/000/0045/0071

60
39
B+1

AUTHOR: Kovtun, R. I.

ORG: none

TITLE: Charge drift in spatially periodic magnetic fields

SOURCE: AN UkrSSR. Magnitnyye lovushki (Magnetic traps). Kiev, Naukova dumka, 1965, 45-71

TOPIC TAGS: constant magnetic field, charged particle, magnetic resonance, Larmor frequency, asymptotic method

21 21

ABSTRACT: The author considers motion of charges in a constant magnetic field which consists of a strong longitudinal field H_0 directed along axis Oz and a week magnetic disturbance which is periodically dependent on z. This periodic perturbation is assumed to be cylindrically symmetric. The problem is solved by the asymptotic method. The calculation is limited to particles with trajectories which pass through the axis of symmetry of the magnetic field and which are not deflected too far from this axis. It is shown that this has absolutely no limiting effect on paraxial rays and that the angle which the charge velocity makes with the axis of symmetry may vary within rather wide limits which may be extended by a more exact approximation of the magnetic field which appears in the equations of motion. Although this makes the computations more

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L 24045-66
ACC NR: AT6008843

laborious, no fundamental difficulties are introduced. The problem is solved in the resonance region and for the case of high transverse velocities. It is shown that when charges drift in a spatially periodic magnetic field with velocities close to the resonance velocity, more than half the kinetic energy of the longitudinal component of motion may be periodically converted to Larmor rotation energy. The width of the resonance velocity region is equal to approximately [2]

$$\sqrt{\varepsilon(1-\xi^2)}W_0, \quad |\xi| \ll 1$$

where W_0 is the absolute charge velocity and ξ is the ratio of the resonance charge velocity to W_0. Orig. art. has: 3 figures, 59 formulas.

SUB CODE: 20/ SUBM DATE: 20Oct65/ ORIG REF: 006/ OTH REF: 000

Card 2/2 dda

L 24046-66 EWT(1)/T IJP(c) WW/GG/GS/AT/GW

ACC NR: AT6008844 SOURCE CODE: UR/0000/65/000/000/0071/0078

AUTHOR: Kovtun, R. I.

ORG: none

TITLE: The case of exact resonance during charge drift in a slowly varying spatially modulated magnetic field

SOURCE: AN UkrSSR. Magnitnyye lovushki (Magnetic traps), Kiev, Naukova dumka, 1965, 71-78

TOPIC TAGS: charged particle, magnetic field, Larmor frequency, magnetic modulation

ABSTRACT: The author considers the motion of charges in a cylindrically symmetric magnetic field which is a superposition of two fields, viz. a strong field $H_0(z)$ which varies slowly with coordinate z (axis oz coincides with the axis of symmetry of the field) and a weak field $\varepsilon H_0(z)\cos\nu z$ ($|\varepsilon| \ll 1$). In other words, the field $H_0(z)$ is modulated by an auxiliary field which is periodically dependent on z but has a constant depth of modulation ε. This problem may be of practical interest since the slow variation of the fundamental (strong) field may be selected in such a way that when certain conditions are fulfilled, the energy of the longitudinal motion of the charge in this field will be continuously "transferred" to Larmor rotation energy and back. It is shown that a nonhomogeneous magnetic field $H_0(z)$ may be chosen which vari-

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L 24046-66
ACC NR: AT6008844

es in space in proportion to the longitudinal component of velocity of particle $v_z(z)$ to satisfy resonance condition for an arbitrarily long time and raise the energy of a particle which may be transferred from energy of longitudinal motion to "transverse" energy and back. Thus it is assumed that a constant ratio $H_0(z)/v_z(z)=C$ is given so that velocity v_z and consequently the magnetic field $H_0(z) = Cv_z(z)$ may be calculated. Only particles with trajectories passing through the axis of symmetry of the system are considered. It is found that an increase in radial field intensity with radius causes a more rapid change in the fundamental field in the case of exact resonance since this field amplification with coordinate r amounts to the same thing as increasing the depth of modulation. Orig. art. has: 18 formulas.

SUB CODE: 20/ SUBM DATE: 20Oct65/ ORIG REF: 000/ OTH REF: 000

Card 2/2 dda

EWT(1)/ETC(f)/EPF(n)-2/EWG(m) IJP(c) GS/AT

ACC NR: AT6008857 SOURCE CODE: UR/0000/65/000/000/0166/0179

AUTHOR: Dushin, L. A.; Kovtun, R. I.; Privezentsev, V. I.; Skibenko, A. I.

ORG: none

TITLE: Microwave refraction by a nonhomogeneous cylindrical plasma

SOURCE: AN UkrSSR. Magnitnyye lovushki (Magnetic traps). Kiev, Naukova dumka, 1965, 166-179

TOPIC TAGS: microwave, plasma density, plasma physics, distribution function

ABSTRACT: The authors consider transmission of microwave beam through a cylindrical plasma with radial density distribution of the form

$$\frac{N(r)}{N_{cr}} = k\left[1 - \left(\frac{r}{r_0}\right)^{\gamma}\right]$$

where $k = \frac{N_{max}}{N_{cr}}$ and N_{max} is the density at the axis of the cylinder. This expression is integrated with respect to the radius and then averaged to give

$$\gamma = \frac{\overline{N}/N_{max}}{1-\overline{N}/N_{max}} = \frac{\overline{N}}{N_{max} - \overline{N}}$$

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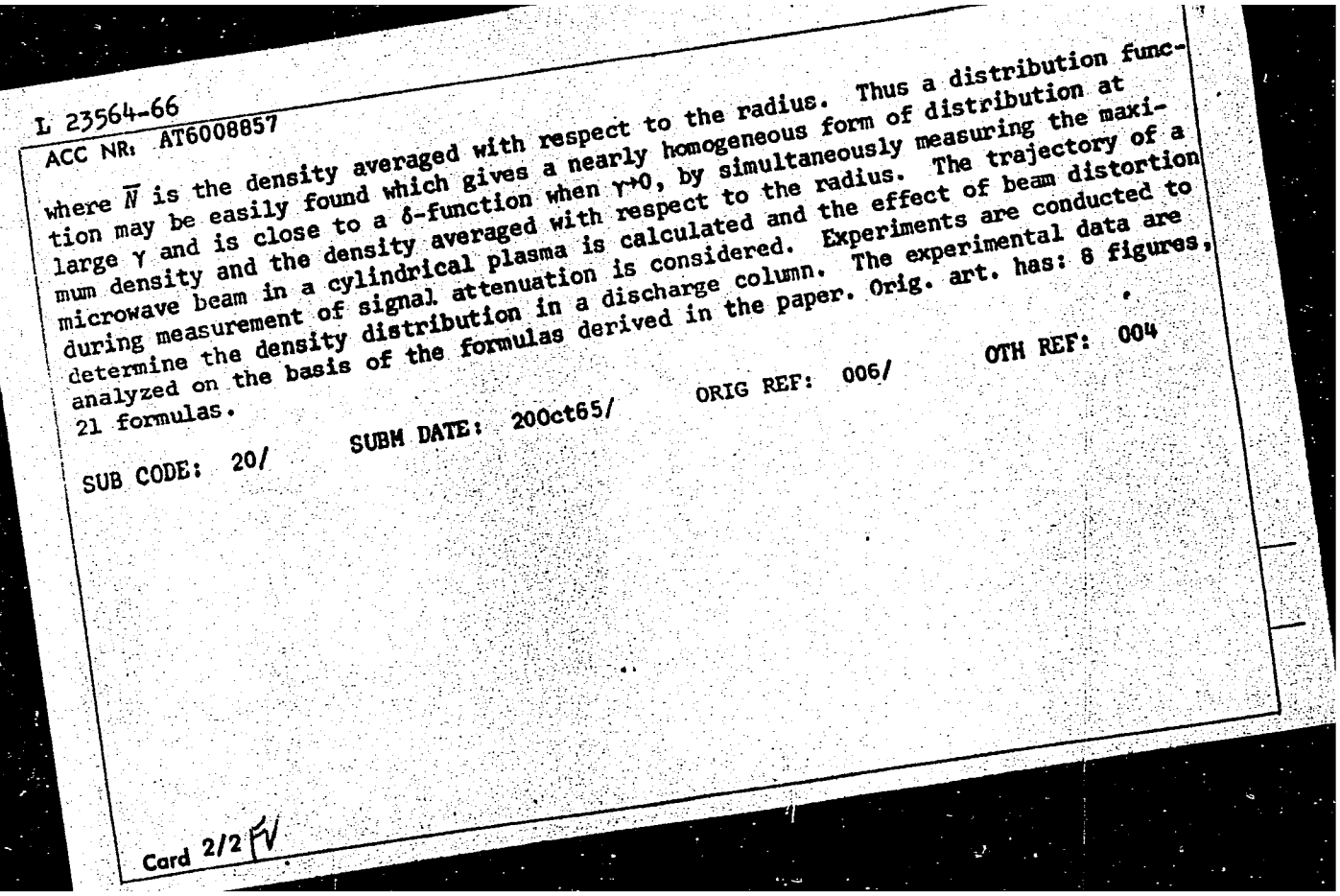

L 23564-66
ACC NR: AT6008857

where $\overline{N}$ is the density averaged with respect to the radius. Thus a distribution function may be easily found which gives a nearly homogeneous form of distribution at large γ and is close to a δ-function when $\gamma \to 0$, by simultaneously measuring the maximum density and the density averaged with respect to the radius. The trajectory of a microwave beam in a cylindrical plasma is calculated and the effect of beam distortion during measurement of signal attenuation is considered. Experiments are conducted to determine the density distribution in a discharge column. The experimental data are analyzed on the basis of the formulas derived in the paper. Orig. art. has: 8 figures, 21 formulas.

SUB CODE: 20/ SUBM DATE: 20Oct65/ ORIG REF: 006/ OTH REF: 004

Card 2/2

DUSHIN, L.A. [Dushyn, L.O.]; KONONENKO, V.I.; KOVTUN, R.I.; SKIBENKO, A.I. [Skybenko, A.I.]; SINEL'NIKOV, K.D. [Synel'nykov, K.D.]; TOLOK, V.T.

Study of a plasma using a microwave interferometer. Ukr. fiz. zhur. 8 no.7:740-746 Jl '63. (MIRA 16:8)

1. Fiziko-tekhnicheskiy institut AN UkrSSR, Khar'kov.
(Plasma (Ionized gases))
(Interferometry)

L 33411-66 EWT(1)/T IJP(c)
ACC NR: AP6015304 (A, N) SOURCE CODE: UR/0057/66/036/005/0827/0842

AUTHOR: Kovtun, R. I.

ORG: none

TITLE: Motion in spatially periodic magnetic fields

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 5, 1966, 827-842

TOPIC TAGS: electron optics, charged particle, magnetic field, particle trajectory, Larmor frequency

ABSTRACT: The author calculates the motion of a charged particle in a constant magnetic field consisting of a strong uniform field on which is superimposed a weak axially symmetric spatially periodic field. Only those trajectories are discussed that intersect the symmetry axis and remain sufficiently close to it. Asymptotic equations for the trajectories are derived by methods that are described in the monograph of Yu.A.Mitropol'skiy (Problemy asimptoticheskoy teorii nestatsionarnykh kolebaniy. Fizmatgiz, 1958), to which reference is made for some details of the calculations. When the ratio v/L (v is the longitudinal velocity of the particle and L is the period of the spatial variation of the magnetic field) is close to the Larmor frequency, there occurs a slow periodic exchange of kinetic energy of forward motion with that of Larmor rotation. The exact resonance in which the frequency of this exchange

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UDC: 537.533.3

L 33411-66

ACC NR: AP6015304

vanishes is unstable. The condition that the strong component of the constant magnetic field be uniform is relaxed and this field is assumed to be a slowly varying function H(z) of the axial coordinate z. When the function H(z) has an appropriate form (which is calculated) the transfer of kinetic energy between the longitudinal and transverse motions of the charged particle becomes unidirectional and continuous. It is suggested that fields with this configuration may find practical application. The author thanks K.D.Sinel'nikov and B.N.Rutkevich for their interest and valuable remarks. Orig. art. has: 93 formulas and 1 figure.

SUB CODE: 20/ SUBM DATE: 09Nov64/ ORIG REF: 005/ OTH REF: 000

Card 2/2 ULR

KOVTUN, R.I.

24.7700 26595 S/185/60/005/003/010/020
D274/D303

AUTHOR: Kovtyn, R.I.

TITLE: Effect of elastic deformation on the electrical conductivity of metals at high temperatures

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 5, no. 3, 1960, 386-395

TEXT: The effect of elastic deformations on the electrical conductivity of metals is considered by Bloch's equation for the distribution function of electrons. It is assumed that the conduction zone is scarcely filled and, therefore, the Fermi surface is small compared to the unit cell of the reciprocal lattice. This makes it possible, when solving Bloch's equation, to assume anisotropic sound-velocity provided it is sufficiently small. This replaces Bloch's assumption on fully isotropic sound-velocity. Cubic symmetry of lattices is assumed. The undeformed lattice is discussed. According to Bloch, the distribution function of electrons, in the

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presence of a weak field F, is

$$f(k,E_K) = f_o(E_K) + g(k,E_K)$$

where k is the wave vector, E_K - the energy, and g - a small additional term to the Fermi function $f_o(E_K)$. After transformations, one obtains (for a spherical Fermi surface) for the conductivity

$$\sigma = 6\pi^2 \frac{e^2 \hbar M v_o^2}{mC^2 \Omega_o k} \cdot \frac{K}{T} \left(\frac{\partial E}{\partial K}\right)^2, \quad K = |k|. \tag{7}$$

here M is the atomic mass, T - temperature, C - a constant, Ω - the Dirac function multiplied by a constant; this formula is identical with Bloch's formula, provided the integration is carried out over the entire Fermi surface. Further, weak anisotropicity of sound is considered:

$$\frac{1}{v^2} = \frac{1}{v_o^2} \left[1 + \varepsilon(q)\right], \quad |\varepsilon(q)| \ll 1 \tag{8}$$

where v_o = const. and $\varepsilon(q)$ - a function of q (q being the wave

vector of sound oscillations). For the conductivity one obtains

$$\sigma = \sigma_0 \left\{ 1 + 3K^{-2} \iint k_F \left(\iint q_F \mathcal{E}(q) dS_q \right) d\sigma_K \right\}. \qquad (9)$$

where σ_0 is the conductivity given by formula (7). $\mathcal{E}(q)$ is calculated from the equation for eigenfrequencies of longitudinal lattice-oscillations, yielding

$$(q) = -\Lambda\gamma(x_1^4 + x_2^4 + x_3^4).$$

where

$$\Lambda = \lambda_{1212}(\lambda_{1122} + \lambda_{1212})^{-1}$$

λ being the stress tensor. After transformations one obtains

$$\sigma = \sigma_0(1 + 0.6\gamma\Lambda)$$

where γ is much smaller than unity, ($u = 1 + \gamma$, $u = \lambda_{1212}^{-1}(\lambda_{1111} - \lambda_{1122})$). As regards the elastically deformed lattice, first, the

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effect of elastic deformations u_{pq} on the velocity of sound in the lattice is considered. In the first approximation, the deformations affect the longitudinal waves only. Further, formulas are derived which show that the conductivity is not only affected by variations of the stress tensor, but also by deformations of the Fermi surface. For the conductivity variations due to variations in λ one obtains

$$\delta\sigma_v = \sigma_o \sum_i \left[u_{ii}(\bar{A} + \bar{B}\cos^2\varphi_i) + \partial_i \left(A + B\cos^2\varphi_i + C\cos^{-1} \varphi_i \prod_{k=1}^{3} \cos\varphi_k \right) \right] \qquad (16)$$

where φ_i are the angles between the vector F and the lattice axes, and A, B, and C are related to the derivatives of the stress tensor. In order to ascertain the effect of deformations of the Fermi surface, the changes in that surface under elongations and shears are considered. These lead to the following expression for the variations in conductivity due to deformations of the Fermi surface:

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$$\delta\sigma_l = \sigma_o\left[\frac{1}{5}(2\gamma_3 + 3\gamma_4)\,\delta V + \frac{4}{5}(\gamma_3 - \gamma_4)\sum_i \delta_i \cos^2\varkappa_i - 2\sum_{i\neq k} u_{ik}\cos\varkappa_i \cos\varkappa_k \right. \quad (25)$$

where V is the lattice potential. By adding Eqs. (25) and (16), the total variation in conductivity is obtained. The foregoing considerations are extended to the case of a polycrystal with an elongation δ_p in the direction of one of the axes. For the conductivity one obtains:

$$\sigma = \sigma_o\{1 + \delta_p(\mathcal{U} + \mathcal{B}\cos^2\omega)\},$$

where

$$\mathcal{U} = 0{,}3\gamma_1 - 0{,}9\gamma_2 + 0{,}45a_1 + b_1 + 0{,}2m - 0{.}1n,$$

$$\mathcal{B} = 0{,}3(\gamma_1 - \gamma_2) + 0{,}15(a_1 - b_1) + 0{,}02(m - n).$$

The experimental values of $\mathcal{U}$ and $\mathcal{B}$ are known for many metals, hence the derivatives of the stress tensor could be determined, and a qualitative estimate obtained for the changes in the Fermi surface

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under elastic deformations, provided the Fermi surface is sufficiently small (of the order of a few tens of a_i^{-1}). The calculations have shown that the assumption of small anisotropic sound-velocity holds for practically all cubic-lattice metals. Finally, if transverse lattice waves are taken into account, the absolute value of the conductivity is affected and the variation $\delta\sigma_v$ (see Eq. (16)) decreases. There are 5 references: 2 Soviet-bloc and 3 non-Soviet-bloc. The references to the English-language publications read as follows: A.H. Wilson, The Theory of Metals, 1952; G.C. Kuczynski, Phys. Rev., 94, 61, 1954) [Abstracter's note: One of the references is a translation into Russian].

ASSOCIATION: Fizyko-tekhnichnyy instytut AN USSR (Physico-technical Institute AS UkrSSR)

SUBMITTED: November 5, 1959

L 1918-66 EWT(1)/ETC/EPF(n)-2/EWG(m)/EPA(w)-2 IJP(c) AT
ACCESSION NR: AP5024128 UR/0185/65/010/009/0977/0984

AUTHOR: Dushin, L. O. (Dushin, L. A.); Kononenko, V. I.; Kovtun, R. I.; Pryvezentsev, V. I. (Privezentsev, V. I.); Skybenko, A. I. (Skibenko, A. I.)

TITLE: Plasma investigation by means of the interferometer and the microwave cut-off method

SOURCE: Ukrayins'kyy fizychnyy zhurnal, v. 10, no. 9, 1965, 977-984

TOPIC TAGS: plasma decay, plasma measurement, plasma diffusion, plasma electron temperature, plasma diagnostics

ABSTRACT: The present paper describes a method for the study of plasma decay permitting a simultaneous measurement of phases and amplitudes of signals transmitted through the plasma. The phases were measured at 136 Gc/s and the amplitudes at 136.74 and 37 Gc/s. A method for plasma diagnostics by means of signals with different frequencies is also presented. An approximation of the radial plasma density distribution by means of the $F \simeq 1 - (r/R)^{\gamma}$ function is discussed (γ is estimated by the measured mean electron density and the maximum density decrease, R is the radius of the plasma cylinder). An estimate is also made of the relative contributions of recombination and diffusion to the plasma decay process. In the

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L 1918-66

ACCESSION NR: AP5024128

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case where recombination is predominant, the recombination coefficient was determined, from which the electron temperature was deduced. A comparison of this temperature with the temperature value obtained by microwave attenuation indicates satisfactory agreement of both methods. Orig. art. has: 27 formulas, 2 figures, and 2 tables.

ASSOCIATION: Fizyko-tekhnichnyy instytut AN URSR, Khar'kov (Physics-Engineering Institute, AN Ukr.SSR)

44,55

SUBMITTED: 09Nov64 ENCL: 00 SUB CODE: ME

NO REF SOV: 005 OTHER: 004

Card 2/2

KOVTUN, R.S.

Effect of the shapes of working parts of drawing dies on the strength and quality of drawings. Kuz.-shtam.proizv. 1 no.3: 22-28 My '59. (MIRA 12:10)

1. Lys'yevskiy metallurgicheskiy zavod.
(Drawing (Metalwork))

KOVTUN, S.D.

Rest currents of muscles and nerves fixed in formalin. Nauk.zap.Kiev.un. 8 no.7:120-148 '50 [i.e.'49]. (MLRA 9:10)

1.Sektor obshchey fiziologii.
(MUSCLES) (NERVES) (FORMALDEHYDE)

KOVTUN, S.D.

Effect of anode and cathode polarization on the function of ganglia.
Nauk.zap.Kiev.un.8 no.7:149-157 '50 [i.e.'49]. (MLRA 9:10)

1.Sektor obshchey fiziologii.
(NERVES) (ELECTROPHYSIOLOGY)

KOVTUN, S.D.

The effect of acetylcholine on the electromotor properties of tissues and nerves. S. D. Kovtun. *Naukovi Zapiski Kiivs'k. Univ.* 12, No. 8, 103-200(1953)(in Ukrainian); *Referat. Zhur., Biol.* 1955, *No.* 7160.—In concns. of 1:500-1:10⁶ acetylcholine (I) induces a negation of the section of the frog muscle to which it has been applied. The effect parallels the concn. of the drug. The differential potential under the effect of I varies with the type of muscle. The depolarizing effect of I in the noninnervated muscle sections is less intense than in the innervated. The negation of the muscle is weakened upon the repeated application of I. Along with changes in the electromotive properties of the extensor muscles I brought about tetanic contractions, about 20% of the cases. In the case of the rectus abdominis muscle and the abdominal section of the chest muscle I induced contraction. I concns. of 1:100-1:5 × 10⁴ induced no noticeable changes in the electromotive properties of the nerves. Preliminary exsernation of the muscle or of the nerve had no effect on the action of I. It is believed that I is not the causal origin of the activity potentials of muscles or nerves. B. S. L.